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| 09/778,338 | 02/07/2001 | Shiro Adaeda | SIMTEK5694 | 1468 |
| 25776 | 7590 | 08/23/2004 | EXAMINER | |
| ERNEST A. BEUTLER, ATTORNEY AT LAW 10 RUE MARSEILLE NEWPORT BEACH, CA 92660 | | | LE, DANG D | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2834 | |

DATE MAILED: 08/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/778,338

Applicant(s)

ADAEDA ET AL.

Examiner

Dang D Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: DECISION ON PETITION

DETAILED ACTION

Response to Arguments

1. In view of the petition filed on 8/14/2003, PROSECUTION IS HEREBY REOPENED.

To avoid abandonment of the application, appellant must exercise one of the following two options:

- (1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,
- (2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

2. Applicant's arguments filed in the Appeal Brief dated 12/9/02 have been fully considered but they are not persuasive.

Regarding applicant's arguments to the objection of drawings, under 37 CFR 1.83(a) the drawings must show every feature of the invention specified in the claims so that a best search can be made. For the record, the examiner did not ignore the proposed drawing correction made by the applicants and included in Paper No. 5. Instead, Figures 5 and 6 have been approved by the examiner and placed in the application. See Office Action Summary, Paper No. 6, item no. 11. The Proposed Sketch is still objected to because it does not provide "the circumferential extent" and "

the range of 120 degrees to 140 degrees” recited in claim 7. See Office Action Summary, Paper No. 6, item no. 10. If the angle that is dependent upon the geometry of the machine and the number of coils and permanent magnet employed, it is not clear how such the angle can not be displayed for a certain geometry of the machine with a certain number of the coils and permanent magnets. The applicants can still provide a drawing with a randomly chosen geometry of the machine and with a randomly selected number of the coils and permanent magnets.

Before making any responses to the applicant’s arguments, the examiner would respectfully like to make a note of a fact that is well known in the art of motor and generator: the electromagnetic steel plates (also known as laminations) are used in manufacturing both rotor cores and stator cores in order to reduce eddy current loss. This fact is also taught in colleges. Please see Kaiser, Electrical Power: Motors, Controls, Generators, Transformer, The Goodheart-Willcox Company, Inc., 1998, p. 311 for “LAMINATION”, U. S. Pat. No. 6,043,583 issued to Kurosawa et al., column 3, lines 12-30 and column 5, lines 35-42, and U. S. Pat. No. 3,679,924 issued to Menzies, column 3, lines 54-57.

In addition, it is well known that magnets can be made either permanently or electromagnetically. Permanent magnets and electromagnets are the main components in every motor and generator. They have both advantages and disadvantages. Permanent magnets eliminate the use of coils wound around the magnetic material and a power source but the magnetic field strength cannot be changed. In contrast, electromagnets require coils and a power source but the

magnetic field strength can easily be adjusted by changing the amount of current flow in the coils from the power source. This fact is widely taught in colleges and universities around the world. The use of permanent magnets and electromagnets can be found in Rand (U.S. Patent No. 3,523,204), column 2, lines 57-58 and column 3, line 42 and in Matsui et al. (U.S. Patent No. 4,937,483), column 1, line 26.

The applicant's argument for claim 1 is on the ground that the laminations in Uchiyama are for the core with coil windings while the laminations in Neumann are for the permanent magnets. In fact, the laminations in Neumann are also for the core of the rotor without permanent magnets. Unlike Figure 3A, the embodiment shown in Figure 1 just includes the core without any electromagnets or permanent magnets. It is further noted that both electromagnets and permanent magnets produce magnetic flux. Therefore, besides using laminations for reducing eddy current loss, the thickness of the laminations disclosed by Neumann can be applied to Uchiyama for minimizing flux leakage. Such modification will optimize the electrical efficiency of the generator.

As a result, it is obvious to one having ordinary skill in the art to use the steel plates having thickness in the range of 0.25 mm and 0.65 mm to make the rotor and stator cores in order to obtain an optimum efficiency. In fact, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Regarding applicant's argument for claims 3 and 4, in the art of motor and generator it is well known that the stators and the rotors are interchangeable and they can be switched in order to obtain the desired function (i.e. converting electrical energy

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to mechanical energy and vice versa.) See attached copies of Jokl, Theory and Design of Synchronous Machines, spring 1993, page 2.

Regarding applicant's argument for claim 6, the laminations are used in the rotor and stator cores for the purpose of reducing eddy current as discussed above. The laminations are always coated with resin or insulating material. In fact, the term "lamination" speaks for itself. For example, a laminated driver license means that the driver license is coated with layers of clear plastic on both sides. In the art of motor and generator, the laminations mean that the steel plates are coated with a thin insulating layer so that eddy current cannot flow from one steel plate to another. Therefore, the laminations of Uchiyama and Neumann are inherently insulated from each other.

Regarding applicant's argument for claims 2 and 5, it is noted that Uchiyama, Neumann, and Yamamoto show different ways to stack the core plates together. Therefore, it is obvious to one having ordinary skill in the art to use one way or the other to make the core.

Regarding applicant's argument for claims 7 and 9-11, although Miyao does not show the spacing, Uchiyama shows the spacing (9) of the permanent magnets (8) and also the spacing (grooves between teeth 15) of the coil windings (16). It is noted that claims 7 and 9-11 do not recite "nonmagnetic spacing" or "air gaps between the magnets" as the applicants imply in the Appeal Brief, page 5, paragraph 5, line 4 and page 6, paragraph 2, line 3, respectively. In contrast to "the spacing of the poles of said permanent magnets" in line 1 of claim 7, the specification of the present application

does not show any nonmagnetic spacing or air gaps between the magnets (22). See Figure 2 for rotor (13) with magnets (22) and page 5, second paragraph.

Although claim 7 requires the range of 120 to 140 degrees, Miyao shows a relationship between the rotor poles and the stator poles with 120 degrees. Therefore, it is obvious of one having ordinary skill in the art to set the relationship between the rotor poles and stator poles of Uchiyama with the range of 120 degrees to 140 degrees for optimum operation.

Regarding applicant's argument for rejection under 35 U.S.C. 112, second paragraph, the Appeal Brief now further confuses the examiner because it implies that there are either nonmagnetic spacing or air gaps between the magnets (22) as shown from paragraph 5, page 5 to paragraph 2, page 6. In contrast, the specification and even the Proposed Sketch show the permanent magnets (22) disposed next together. It seems to the examiner that the limitation "the spacing of the poles of said permanent magnets" not only lacks antecedent basis within the claim but also within the entire specification if "the spacing" means "air gaps between the magnets."

As a result, the rejection is still deemed proper and repeated hereinafter.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 7 and 9-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites the limitations "the spacing of the poles of the permanent magnets " in line 1, "the number and spacing of the coils" in line 2 and "the circumferential extent" in line 4. There is insufficient antecedent basis for those limitations in the claim. It is not clear what "their number" refers to.

As a result, it is not clear how "their number" and "the number and spacing of the coils" are set. It is neither clear how "the circumferential extent of each of the magnet poles (the magnet electrical angle) lies in the range of 120° to 140° of such relative rotation."

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1, 3, 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchiyama in view of Neumann.

Regarding claim 1, Uchiyama shows a rotating machine (Figures 1a and 1b) having a plurality of permanent magnet (8) having alternating pluralities in a circumferential direction at equally spaced intervals and a relatively rotatable associated element (11) having a plurality of armatures (15) around which coil windings (16) are formed, the armatures are formed from a lamination of a plurality of electromagnetic steel plates.

Uchiyama does not show the electromagnetic steel plates having a thickness in the range of 0.25-0.65mm.

Neumann shows electromagnetic steel plates having a thickness in the range of 0.36-0.64mm (column 4, lines 25-28) for the purpose of providing a high strength motor with minimum flux leakage.

Since Uchiyama and Neumann are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the electromagnetic steel plates having a thickness in the range of 0.25-0.65mm to make a stator core as taught by Neumann for the purpose discussed above.

Regarding claim 3, it is noted that Uchiyama also shows the machine comprising an electrical generator.

Regarding claim 4, it is noted that Uchiyama also shows the permanent magnets rotating and the coil windings fixed against rotation.

Regarding claim 6, it is noted that Uchiyama also shows an insulating layer (plates being coated) being fixed to at least one surface of each of the electromagnetic steel plates.

8. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uchiyama in view of Neumann as applied to claim 1 above, and further in view of Yamamoto.

Regarding claim 2, the rotating machine of Uchiyama modified by Neumann includes all of the limitations of the claimed invention except for the electromagnetic steel plates interlocked relative to each other by series of partially punched openings forming holes and projections, which inter-fit with each other so as to line up the electromagnetic steel plates in relationship to each other and to provide a mechanical coupling there between.

Yamamoto shows the electromagnetic steel plate interlocked relative to each other by series of partially punched openings forming holes (9a) and projections (9), which inter-fit with each other so as to line up the electromagnetic steel plates in relationship to each other and to provide a mechanical coupling there between for the purpose of making an armature core.

Since Uchiyama, Neumann and Yamamoto are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to interlock the electromagnetic steel plates relative to each other by series of partially punched openings forming holes and projections, which inter-fit with each other so as to line up the electromagnetic steel plates in relationship to each other and to provide a mechanical coupling there between as taught by Yamamoto for the purpose discussed above.

9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uchiyama in view of Neumann as applied to claim 4 above, and further in view of Yamamoto and Nose.

Regarding claim 5, the rotating machine of Uchiyama modified by Neumann includes all of the limitations of the claimed invention except for the electromagnetic steel plates being interlocked relative to each other by series of partially punched openings forming holes and projections, which inter-fit with each other so as to line up the electromagnetic steel plates in relationship to each other and to provide a mechanical coupling there between, the partially punched openings being provided in each tooth of the stator core.

Yamamoto shows the electromagnetic steel plate interlocked relative to each other by series of partially punched openings forming holes (9a) and projections (9), which inter-fit with each other so as to line up the electromagnetic steel plates in relationship to each other and to provide a mechanical coupling there between for the purpose of making an armature core.

Nose shows the partially punched openings forming holes (14) and projections provided in each tooth of the stator core (Figure 4) for the purpose of making an armature core.

Since Uchiyama, Neumann, Yamamoto and Nose are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art interlock the electromagnetic steel plates relative to each other by series of partially punched openings forming holes and projections, which inter-fit with each other so as to line up the electromagnetic steel plates in relationship to each other and to provide a mechanical coupling there between and to provide the partially punched openings forming holes and projections in each tooth of the stator core as respectively taught by Yamamoto and Nose for the purpose discussed above.

10. Claims 7, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchiyama in view of Neumann as applied to claim 1 above, and further in view of Miyao.

Regarding claim 7, the rotating machine of Uchiyama modified by Neumann includes all of the limitations of the claimed invention except for the spacing of the poles of the permanent magnets and their number and the number and spacing of the coils being set so that if the degree of rotation during which each coil experiences a complete cycle of electrical current is taken as 360 degrees the circumferential extent of each of

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the magnet poles (the magnet electrical angle) lies in the range of 120° to 140° of such relative rotation.

Miyao shows the magnet electrical angle of the poles of the permanent magnets being set with respect to the rotational axis to be in an electrical angle of 120° for the purpose of reducing cogging torque.

Since Uchiyama, Neumann and Miyao are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to set the spacing of the poles of the permanent magnets and their number and the number and spacing of the coils so that if the degree of rotation during which each coil experiences a complete cycle of electrical current is taken as 360 degrees the circumferential extent of each of the magnet poles (the magnet electrical angle) lies in the range of 120° to 140° of such relative rotation as taught by Miyao for the purpose discussed above.

Regarding claim 9, it is noted that Uchiyama also shows the machine comprising an electrical generator.

Regarding claim 10, it is noted that Uchiyama also shows the permanent magnets rotating and the coil windings fixed against rotation.

11. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uchiyama in view of Neumann and Miyao as applied to claim 10 above, and further in view of Yamamoto.

Regarding claim 11, the rotating machine of Uchiyama modified by Neumann and Miyao includes all of the limitations of the claimed invention except for the electromagnetic steel plate interlocked relative to each other by series of partially punched openings forming holes and projections, which inter-fit with each other so as to line up the electromagnetic steel plates in relationship to each other and to provide a mechanical coupling there between.

Yamamoto shows the electromagnetic steel plate interlocked relative to each other by series of partially punched openings forming holes (9a) and projections (9), which inter-fit with each other so as to line up the electromagnetic steel plates in relationship to each other and to provide a mechanical coupling there between for the purpose of making an armature core.

Since Uchiyama, Neumann, Yamamoto and Miyao are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to interlock the electromagnetic steel plates relative to each other by series of partially punched openings forming holes and projections, which inter-fit with each other so as to line up the electromagnetic steel plates in relationship to each other and to provide a mechanical coupling there between as taught by Yamamoto for the purpose discussed above.

Information on How to Contact USPTO

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dang D Le whose telephone number is (703) 305-0156.

The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308-1371. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

~~1/7/04~~

5/18/04

A handwritten signature in cursive script, appearing to read 'Dang D Le'.

DANG LE
PRIMARY EXAMINER